

ENVIRONMENTAL PROTECTION COMMISSION [567]

Adopted and Filed

Pursuant to the authority of Iowa Code section 455B.474, the Environmental Protection Commission is adopting amendments to Chapter 135, “Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks,” Iowa Administrative Code. The Notice of Intended Action was published as ARC 6596B in the February 13, 2008 issue of the Iowa Administrative Bulletin.

Chapter 135 defines the Risk-Based Corrective Action (RBCA) assessment process for underground storage tank releases. Sites are classified as high risk, low risk, and no further action based on this RBCA assessment process. A three-tiered process is used to evaluate risk. At Tier 1 a site may be classified without soil and groundwater plumes being defined. Tier 2 requires the vertical and horizontal extent of soil and groundwater plumes to be defined and uses a model to predict the maximum horizontal extent of groundwater movement. Tier 3 allows the use of alternative and more site specific assessment tools to classify risk.

Since 1996, a two-dimensional model has been used in RBCA to evaluate and predict the risk of groundwater contamination migrating horizontally and impacting a receptor such as a drinking water well. If a receptor falls within the actual groundwater plume or within the modeled plume, then the receptor is presumed to be at risk of impact. If a receptor falls outside both plumes, it is not considered to be at risk.

There has been a perception that the length of plumes generated by the current Tier 2 groundwater model (Appendix B-1 old model) may significantly over-estimate the horizontal length of actual groundwater contamination plumes. Therefore, after ten years of use, a decision was made to recalibrate the model to better fit actual data. The Iowa Department of Natural Resources (department) formed a technical advisory group to work on recalibrating the model based on observations made during the first decade of use. The revised Tier 2 software model (revised Appendix B model) found in these amendments is the result of the work of this technical advisory group.

The Tier 2 model is used to predict horizontal movement to a concentration, a “target level”, such as 5 parts per billion (ppb) benzene. The new model results in shrinking the modeled plume size. For example, in the old model the average projected benzene

groundwater plume (5 ppb) was 8.6 times larger than the actual plume. With the revised model, the average projected benzene groundwater plume (5 ppb) is only 2.6 times larger. It is important to realize these are only “averages”, which means that in some cases, the revised model may predict movement less than 2.5 times the actual plume and sometimes greater than 2.5 times. In addition, the Tier 2 groundwater transport model, old or revised, only predicts the horizontal movement of the groundwater, and data collected for the modeling is generally from surficial water table monitoring points. It does not evaluate the potential vertical movement of the contaminants in the aquifer or the influence of pumping wells on the groundwater movement.

These rules substitute the new model into the existing rule structure. The rules provide a transition policy and procedures which gives owners and operators the option of electing to continue evaluating their site under the new or the old model.

Because the recalibrated modeled plume may in some cases be significantly smaller than the previously modeled plumes and because the model does not sufficiently evaluate the vertical movement and the influence of pumping wells, the Notice of Intended Action proposed amendments included some special procedures, in addition to the new model, for evaluating the risk to public water supply wells when the well falls outside the modeled plume but may still be at risk due to vertical movement of the groundwater and the pumping influence of the wells. These final amendments are the result of taking into account written and oral comments and the result of further stakeholder meetings subsequent to publication of the Notice of Intended Action. A "public water supply well risk assessment" is triggered if a public water supply well is located within 2,500 feet of an underground storage tank release and would only apply to RBCA assessments of new releases or for the optional re-evaluation of old release sites using the revised model. The rules rely on groundwater professionals to conduct a risk analysis based on available information and submit a recommendation based on their professional judgment to the department as to the potential risk of impact to a public water supply well from the leaking underground storage tank release. If the department agrees with the groundwater professional's recommendation that it is unlikely the well is at risk of impact, the department may classify the well as no action required. If the department disagrees, the department then has the burden to establish a sufficient basis to show that the public

water supply well more likely than not is at risk. If so, the owner and operator is responsible for submitting a Tier 3 work plan to further assess risk to the well.

Three public hearings were held on March 4, 5, and 6, 2008, to receive comment on the Notice of Intended Action. In addition, the department appeared before Administrative Rules Review Committee (ARRC) on March 7, 2008, and again on May 13, 2008. At the March ARRC meeting to discuss the Notice of Intended Action revisions to IAC Chapter 135, the ARRC requested and the department and present stakeholders agreed to reconvene with other stakeholders and continue to try to resolve differences regarding these amendments. The ARRC also requested and the department agreed to conduct what was referred to as an informal regulatory analysis consistent with the provision in Iowa Code section 17A.4A.

The department conducted seven meetings between the March and May ARRC meetings to receive additional stakeholder and public input on these amendments. The department formed a “core stakeholder group” that consisted of representatives from the Iowa UST Fund, the Petroleum Marketers Management Insurance Company (PMMIC), Petroleum Marketers and Convenience Stores of Iowa (PMCI), Groundwater Professionals of Iowa, the Iowa Association of Water Agencies (IAWA), in addition to the department. The amendments in their current form were written after these additional stakeholder meetings and were presented at the May ARRC meeting along with the informal regulatory analysis.

Comments on the rule were received during the public comment period and at both of the ARRC meetings. Based on comments received, the most controversial part of the rule amendments is the new requirement for the special assessment procedures for public water supply well receptors.

Comments in opposition to the special assessment procedures for public water supply wells were received from the Comprehensive Petroleum Underground Storage Tank Fund Board and the regulated community including PMCI, PMMIC, Casey’s General Stores, and Krause Gentle Corporation. The opposition comments generally revolved around the assertion that the recalibrated Tier 2 model is adequate for assessing risk to pumping wells and therefore, the special procedures for assessment of risk to public water supply wells are unnecessary, overly burdensome, and may result in excessive assessment costs.

Comments supporting the special procedures for public water supply well risk evaluation were received from the City of Sioux City, Atlantic Municipal Utilities, Iowa Rural Water Association, Iowa League of Cities, and the Iowa Association of Water Agencies. Those commenting in support of the special procedures for assessing risk to public water supply wells generally agreed that information on the susceptibility of the well aquifer and the predicted capture zone of the well should be considered when evaluating risk to the well from the underground storage tank release and that performance of the special assessment procedures provides necessary and added protection for public water supplies.

In an attempt to give reservation authority for receptors which fall outside of the modeled plumes, the Notice of Intended Action contained discretionary language which would have enabled the department to require a risk assessment for receptors other than public water supply wells, including but not limited to private drinking water wells and enclosed spaces. This provision was stricken from the amendments due to concerns by stakeholders that it was too broad. However, the department believes it may have the authority on a case-by-case basis to require risk assessment or corrective action for receptors outside of the modeled plume if there is an imminent risk or hazardous condition.

The department will review the public water supply risk assessment procedure at least two years after adoption, if there is a request made by stakeholders. The expectation is that after two years there will be a better understanding by all stakeholders of this policy and procedure.

The amendments contain other less controversial policy changes including incorporating into rule some current practices. For example, the department conducted an extensive business improvement process with stakeholders which resulted in developing a process by which all interested parties come together for a meeting in person or by telephone conference to discuss all outstanding issues and try to reach consensus on a plan to move a site into remediation or some alternative track to regulatory closure. This practice is incorporated into the amendments and clarifies that failure of an owner/operator to comply with the terms of the "memorandum of agreement" would be considered a violation of the rules and subject to enforcement. The

amendments also require sampling for chemicals of concern of all drinking and non-drinking water wells within 100 feet of the actual groundwater plume.

A copy of the comments and the department's response can be requested by contacting Tammy Vander Bloemen, DNR, 502 East 9th Street, Des Moines, IA 50319; telephone (515) 218-8957 or email tammy.vander_bloemen@dnr.iowa.gov.

These amendments are intended to implement Iowa Code section 455B.474. The following amendments are adopted.

ITEM 1: Amend rule **567-135.2(455B)** as follows:

Adopt the following **new** definitions in alphabetical order:

"Corrective action meeting process" is a series of meetings organized by department staff with owners or operators and other interested parties such as certified groundwater professionals, funding source representatives, and affected property owners. The purpose of the meeting process is to develop and agree on a corrective action plan and the terms for implementation of the plan.

"Corrective action plan" is a plan which specifies the corrective action to be undertaken by the owner or operator in order to comply with requirements in this chapter and which is incorporated into a memorandum of agreement or other written agreement between the department and the owner or operator. The plan may include but is not limited to provisions for additional site assessment, site monitoring, Tier 2 revisions, Tier 3 assessment, excavation and other soil and groundwater remediation.

"Memorandum of Agreement" is a written agreement between the department and the owner or operator which specifies the corrective action that will be undertaken by the owner or operator in order to comply with requirements in this chapter and terms for implementation of the plan. The plan may include, but is not limited to, provisions for additional site assessment, site monitoring, Tier 2 revisions, Tier 3 assessment, excavation, and other remedial activities.

"Public Water Supply Well" is a well connected to a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days out of the year.

“Sensitive Area” is a screening tool used to determine if a public water supply well warrants a more in-depth assessment. It is not intended to be a mechanism to assign a risk classification to the public water supply well receptor. Sensitive area describes the area within the Iowa Geological Survey’s designated five-year capture zone for any public water supply well; or if the Iowa Geologic Survey has not designated a five-year capture zone for a public water supply well, the area within 2,500-foot radius of the public water supply well and where the Iowa Geological Survey has given the public water supply well aquifer a source water protection aquifer designation of susceptible or highly susceptible.

ITEM 2 Amend Rule **567-135.8 (1)** as follows:

Add paragraph “**d**”:

d. Notification. Whenever the department requires a tiered site assessment and a public water supply well is within 2,500 feet of a leaking underground storage tank site, the department will notify the public water supply operator.

ITEM 3 Amend subrule **135.9(4)** as follows:

Add paragraph “**f**”

f. Receptor evaluation for public water supply wells. If a public water supply well is located within 2,500 feet of the underground storage tank source area, a Tier 2 assessment must be completed for the this pathway in accordance with 135.10, unless the department agrees with the recommendation of the owner or operator’s groundwater professional that it is unlikely the public water supply well is at risk, even without the benefit of soil and groundwater plume definition and a Tier 2 pathway assessment. The groundwater professional may take into account the factors specified in 135.10(11) “h”.

ITEM 4. Amend paragraphs **135.10(4) “a”, “b”, and “e”**, add paragraph “**f**”, renumber and add paragraph “**k**”:

a. Pathway completeness. Unless cleared at Tier 1, this pathway is complete and must be evaluated under any of the following conditions: (1) the first encountered groundwater is a protected groundwater source; or (2) there is a drinking water well or a non-drinking water well within the modeled groundwater plume or the actual plume as provided in

135.10(2)“j” and 135.10(2)“k”. A public water supply screening and risk assessment must be conducted in accordance with 135.10(4)“f” for this pathway.

b. Receptor evaluation. All drinking and non-drinking water wells located within 100 feet of the largest actual plume (defined to the appropriate target level for the receptor type) must be tested, at a minimum, for chemicals of concern as part of the receptor evaluation. Actual plumes refer to groundwater plumes for all chemicals of concern. Untreated or raw water must be collected for analysis unless it is determined to be infeasible or impracticable. The certified groundwater professional or the department may request additional sampling of drinking and non-drinking water wells as part of their evaluation.

All existing drinking water wells and non-drinking water wells within the modeled plume or the actual plume as provided in paragraph “a” must be evaluated as actual receptors. Potential receptors only exist if the groundwater is a protected groundwater source. Potential receptor points of exposure are those points within the modeled plume or actual plume that exceed the potential point of exposure target level. The point(s) of compliance for actual receptor(s) is the receptor. The point(s) of compliance for potential receptor(s) is the potential receptor point of exposure as provided in 135.10(2)“j” and 135.10(2)“k.”

e. Modeling. At Tier 2, the groundwater well located within the modeled plume is assumed to be drawing from the contaminated aquifer, and the groundwater transport model is designed to predict horizontal movement to the well. If the groundwater professional determines that assessment of the vertical movement of contamination is advisable to determine the potential or actual impact to the well source, a Tier 3 assessment of this vertical pathway may be conducted. The groundwater professional shall submit a work plan to the department specifying the assessment methods and objectives for approval in accordance with 135.11(455B). Factors which should be addressed include, but are not limited to, well depth and construction, radius of influence, hydrogeologic separation of aquifer, preferential pathways, and differing water quality characteristics.

f. Public Water Supply Well Assessment. The groundwater professional shall identify all public water supply wells located outside the applicable modeled plume but within

2,500 feet of the leaking underground storage tank site. The certified groundwater professional shall conduct a preliminary assessment of the potential risk of impact from the underground storage tank release to the public water supply well based on available information and taking into account the assessment factors in 135.10(11)"h" and other relevant considerations. The certified groundwater professional shall submit a public water supply well risk assessment report either prior to or along with the Tier 2 site cleanup report. The risk assessment shall at a minimum provide an analysis of the potential risk of impact from the underground storage tank site release to the public water supply well and a recommendation as to whether it is unlikely the underground storage tank release poses an unreasonable risk of impact to the well. If the groundwater professional determines that a professional judgment cannot reasonably be offered without collection of further data, the report shall make a recommendation as to what further data might be developed to assess the risk to the well.

k. Notification of Well Owners. Upon receipt of a Tier 2 site cleanup report and as soon as practicable, the department shall notify the owner of any public water supply well identified within the Tier 2 site cleanup report that a leaking underground storage tank site is within 2,500 feet and an assessment has been performed.

ITEM 5 Amend subrule **135.10(11)** by adding paragraph “h”

h. Review of the public water supply receptor risk assessment. The department shall review the public water supply well risk assessment report submitted pursuant to 135.10(4) independently or as part of its review of the Tier 2 site cleanup report. Factors which the department may consider when reviewing the risk assessment report include, but are not limited to:

(1). The location of the underground storage tank site within a sensitive area as defined in 135.2 for any identified public water supply well and if so, the potential risk of impact to the well taking into account the well's capture zone and the aquifer susceptibility designation.

(2). Reports of petroleum constituents in the raw or finished water samples from the public water supply well.

(3). Whether corrective action may be required or has been completed for other receptors or pathways which could prevent impact to the public water supply well.

(4). Test results showing the presence or absence of detectable levels of petroleum constituents in a public water supply well, and to what extent the underground storage tank site release or other facilities in the area may be a source or contributing source.

(5). The presence of elevated concentrations of chemicals of concern in the soil or groundwater relative to the distance to the public water supply well and groundwater fate and transport data from other contaminated sources in the vicinity.

(6). Available information on the pumping capacity of the public water supply well and related zone of capture.

(7). Detections of chemicals in water samples tending to establish the integrity of the well has been compromised or that there is a connection between the contaminated aquifer and the well's source water aquifer.

(8). Available information, including hydrogeological data from other sources in the vicinity, as to the nature and extent of any confining layer between the public water supply well aquifer and the contaminated aquifer.

(9). Information supplied from the public water supply well operator including but not limited to well construction, age, integrity, and pumping capacity.

(10). Water quality data and/or detections of chemicals tending to establish the integrity of the wells has been compromised or that there is a connection between the contaminated aquifer and the public water supply well.

(11). The distance between the leaking underground storage tank site and the public water supply well.

(12). The age of the release.

(13). Alternative modeling including, but not limited to, mass flux modeling.

If the department concurs with the certified groundwater professional's risk analysis and recommendation that it is unlikely the underground storage tank site release poses an unreasonable risk of impact to the public water supply well, the department may classify the well as no action required.

If after taking into account the groundwater professional's risk analysis, professional recommendations and other relevant data, the department does not accept the certified groundwater professional's recommendations, the department must demonstrate that there is a hydrogeological connection between the underground storage tank contaminated

aquifer and the public water supply well and that the underground storage tank release more likely than not poses an unreasonable risk of impact to the public water supply well. If the department establishes this level of proof, it may disapprove the assessment report and require the owner and operator through their certified groundwater professional to submit a Tier 3 work plan. The work plan shall propose what further assessment methods and data would be sufficient to confirm the nature and extent of any risk of impact to the public water well from the underground storage tank site release. As an alternative to submitting a Tier 3 work plan for this receptor, owners or operators may participate in a corrective action meeting process to develop a Tier 3 work plan or other corrective action plan, which would be incorporated into a memorandum of agreement or other written agreement approved by the department

ITEM 6 Amend paragraphs **135.12 (3) “d”** and **“e”** as follows:

d. A corrective action design report (CADR) must be submitted by a certified groundwater professional for all high risk sites unless the terms of a corrective action plan are formalized in a memorandum of agreement within a reasonable time frame specified by the department. The CADR must be submitted on a form provided by the department and in accordance with department CADR guidance within 60 days of site classification approval as provided in 135.10(11). The CADR must identify at least two principally applicable corrective action options designed to meet the objectives in 135.12(3), an outline of the projected timetable and critical performance benchmarks, a specific monitoring proposal designed to verify its effectiveness and provide sufficient supporting documentation consistent with industry standards that the technology is effective to accomplish site-specific objectives. The CADR must contain an analysis of its cost effectiveness in relation to other options. The department will review the CADR in accordance with 135.12(9).

e. Interim monitoring. From the time a Tier 2 site cleanup report is submitted and until the department determines a site is classified as no action required, interim monitoring is required at least annually for all sites classified as high risk. Groundwater samples must be taken: (1) from a monitoring well at the maximum source concentration; (2) a transition well meaning a monitoring well with detected levels of contamination closest to the leading edge of the groundwater plume as defined to the pathway-specific

target level, and between the source(s) and the point(s) of exposure; and (3) a guard well meaning a monitoring well between the source(s) and the point(s) of exposure with concentrations below the SSTL line. If a receptor is located within an actual plume contoured to the applicable target level for that receptor the point of exposure must be monitored. If concentrations at the receptor already exceed the applicable target level for that receptor corrective actions must be implemented as soon as practicable. If concentrations at the point of exposure already exceed the SSTL, the point of exposure must be monitored.—Monitoring conducted as part of remediation or as a condition of establishing a no action required classification may be used to the extent it meets this criteria. Soil monitoring is required at least annually for all applicable pathways in accordance with 135.12(5)“d.”. All drinking water wells and non-drinking water wells within 100 feet of the largest actual plume (defined to the appropriate target level for the receptor type) must be tested annually for chemicals of concern. Actual plumes refer to groundwater plumes for all chemicals of concern.

ITEM 7 Amend paragraphs **135.12 (9) “a”** and **“d”** as follows:

a. Owners and operators must submit a corrective action design report (CADR) within 60 days of the date the department approves or is deemed to approve a Tier 2 assessment report under 135.10(11) or a Tier 3 assessment is to be conducted. The department may establish an alternative schedule for submittal. As an alternative to submitting a CADR, owners or operators may participate in a corrective action meeting process to develop a corrective action plan which would be incorporated into a memorandum of agreement or other written agreement approved by the department. Owners or operators shall implement the terms of an approved CADR, memorandum of agreement or other corrective action plan agreement.

d. Review. Unless the report proposes to classify the site as no action required, the department must approve the report within 60 days for purposes of completeness or disapprove the report upon a finding of incompleteness, inaccuracy or noncompliance with these rules. If no decision is made within this 60-day period, the report is deemed to be approved for purposes of completeness. The department retains the authority to review the report at any time a no action required site classification is proposed. Owners or operators who fail to implement actions or meet the activity schedule in a memorandum

of agreement resulting from a corrective action meeting or other written corrective action plan agreement or who fail to implement the actions or schedule outlined in an approved CADR are subject to legal action.

ITEM 8 Adopt **new** subrules 135.18(5), 135.18(6) and 135.18(7):

135.18(5) Risk based corrective action assessment reports, corrective action plans, and corrective action design reports accepted before (effective date of revised rule). Any owner or operator who had a Tier 2 site cleanup report, Tier 3 report, or corrective action design report approved by the department before **(effective date of revised rule)**, may elect to submit a Tier 2 site cleanup report using the revised Appendix B model, department developed software and rules in effective as of **(effective date of revised rule)**. The owner or operator shall notify the department that they wish to evaluate the leaking underground storage tank site with the revised Appendix B model, software and rules. If the owner or operator so elects, the site shall be assessed, classified, and, if necessary, remediated, in accordance with the rules of the department as of **(effective date of revised rule)**. If the leaking underground storage tank site is undergoing active remediation, the remediation system shall remain operating until the re-evaluation is completed and accepted or as otherwise approved by the department. Once a site has been evaluated using the revised Appendix B model, software and rules in effect as of **(effective date of revised rule)**, it can no longer be evaluated with the Appendix B-1 old model and software and rules in effect prior to **(effective date of revised rule)**.

135.18(6) Risk based corrective action assessment reports, corrective action plans, and corrective action design reports in the process of preparation with a submittal schedule established prior to (effective date of revised rule). The owner or operator must notify the department they wish to use the revised Appendix B model and department software and rules in effect as of **(effective date of revised rule)** to evaluate the leaking underground storage tank site before submitting the next report, and prior to expiration of the previously established submittal schedule. Once a site has been evaluated using the revised model, software and rules in effect as of **(effective date of revised rule)**, it can no longer be evaluated with the Appendix B-1 old model, software and rules existing just prior to **(effective date of revised rule)**.

135.18(7) Risk based corrective action assessment reports, corrective action plans, and corrective action design reports received by the department but not yet reviewed. The owner or operator will notify the department within 60 days of (**effective date of revised rule**) whether the owner or operator is electing to complete a risk based corrective action assessment using revised Appendix B model, department software and rules effective as of (**effective date of revised rule**) or proceeding with the risk based corrective action assessment using Appendix B-1 old model and department rules existing prior to (**effective date of revised rule**). Once a site has been evaluated using the revised Appendix B model, software and rules it can no longer be evaluated with the previous Appendix B-1 old model, software and rules.

ITEM 9. Amend 567-Chapter 135 Appendix B as follows:

(1). Amend existing Appendix B by re-naming it as follows:

Appendix B-1 - Tier 2 Equations and Parameter Values (Old Model)

(2). Amend the title to Appendix B as follows and rescind the Equation for the Tier 2 Groundwater Contaminant Transport Model and adopt the following new Equations (1) and (2) and Table 1:

Appendix B - Tier 2 Equations and Parameter Values (Revised Model)

All Tier 1 equations and parameters apply at Tier 2 except as specified below.

Equations for Tier 2 Groundwater Contaminant Transport Model

Equation (1)

$$C(x) = C_s \exp\left(\frac{x_m}{2\alpha_x} \left[1 - \sqrt{1 + \frac{4\lambda\alpha_x}{u}}\right]\right) \operatorname{erf}\left(\frac{S_w}{4\sqrt{\alpha_y x_m}}\right) \operatorname{erf}\left(\frac{S_d}{4\sqrt{\alpha_z x_m}}\right) \quad (1)$$

Equation (2)

Where $x_m = ax + bx^c$ (2)

The value of X_m is computed from equation (2), where the values for a, b and c in equation (2) are given in Table 1.

Table 1. Parameter values for equation (2)

<u>Chemical</u>	<u>a</u>	<u>b</u>	<u>C</u>
<u>Benzene</u>	<u>1</u>	<u>0.000000227987</u>	<u>3.929438689</u>
<u>Toluene</u>	<u>1</u>	<u>0.000030701</u>	<u>3.133842393</u>
<u>Ethylbenzene</u>	<u>1</u>	<u>0.0001</u>	<u>2.8</u>
<u>Xylenes</u>	<u>1</u>	<u>0.0</u>	<u>0.0</u>
<u>TEH-Diesel</u>	<u>1</u>	<u>0.000000565</u>	<u>3.625804634</u>
<u>TEH-Waste Oil</u>	<u>1</u>	<u>0.000000565</u>	<u>3.625804634</u>
<u>Naphthalene</u>	<u>1</u>	<u>0</u>	<u>0</u>

Amend the First-order Decay Coefficients Table, Groundwater Transport Modeling Parameters, as follows:

Groundwater Transport Modeling Parameters (continued)
First-order Decay Coefficients

Chemical	Default Value λ (d ⁻¹)	Required
Benzene	0.0005 <u>0.000127441</u>	default
Toluene	0.0007 <u>0.0000208066</u>	default
Ethylbenzene	0.00013 <u>0.0</u>	default
Xylenes	0.0005	default
Naphthalene	0.00013	default
Benzo(a)pyrene-TEH- <u>Diesel</u>	<u>0.0000554955</u>	default
Benz(a)anthracene-TEH- <u>Waste Oil</u>	<u>0.0000554955</u>	default
Chrysene	<u>0</u>	default